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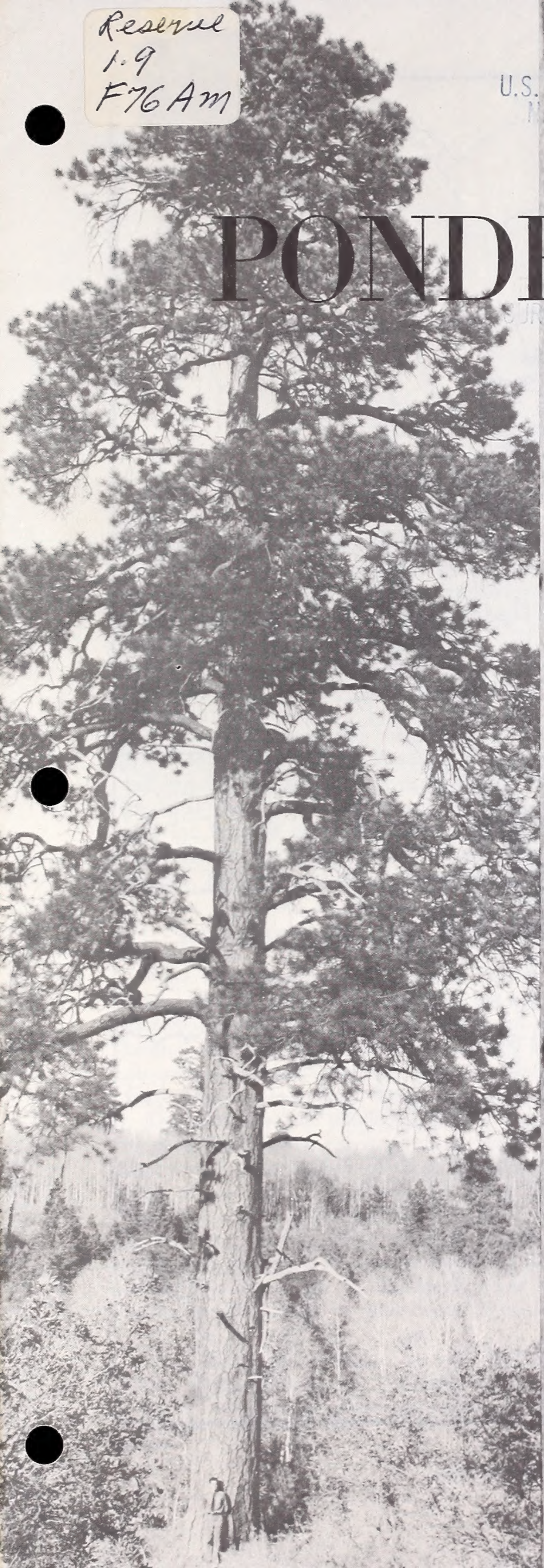

PONDEROSA PINE

. . . an American wood

Ponderosa pine is the most widespread and one of the most important softwoods in North America. The wood is light in weight, averaging about 30-50 pounds per cubic foot (air dry). Grain is straight; texture, fine and even, and it works well under all processing operations. It finishes well, seasons easily and stays in place well after drying. It is the principal species in the United States for millwork, including windows, doors, shelving, molding, knotty-pine paneling, and other items requiring soft-textured softwoods.

FS-254
June 1973
U.S. Department of Agriculture Forest Service

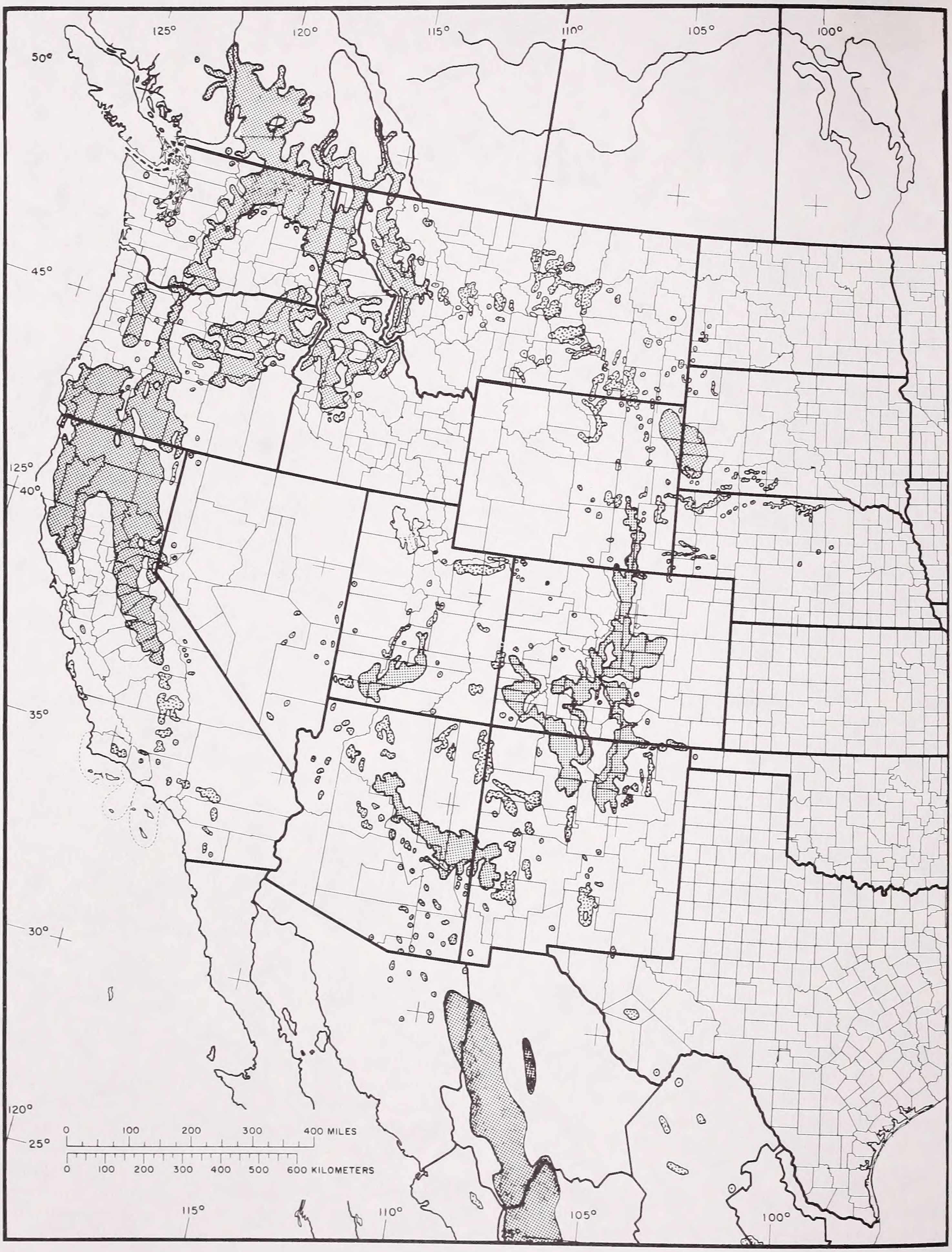

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Figure 1.—Natural range of ponderosa pine.

Cover: F-388600

PONDEROSA PINE

. . . an American wood

Edward S. Kotok[1]

DISTRIBUTION

Ponderosa pine *(Pinus ponderosa* Laws.) is the most widely distributed pine in North America, extending from British Columbia to Mexico and from the Pacific Coast to Nebraska. The species grows from latitude 51°N. to 24°N. and from longitude 99°30′W. to 124°W. Commercial stands occur in the 11 Western States, British Columbia, and Mexico (fig. 1). It grows in more than 20 forest types, often as a part of the climax vegetation. In some areas it occurs in extensive pure stands.

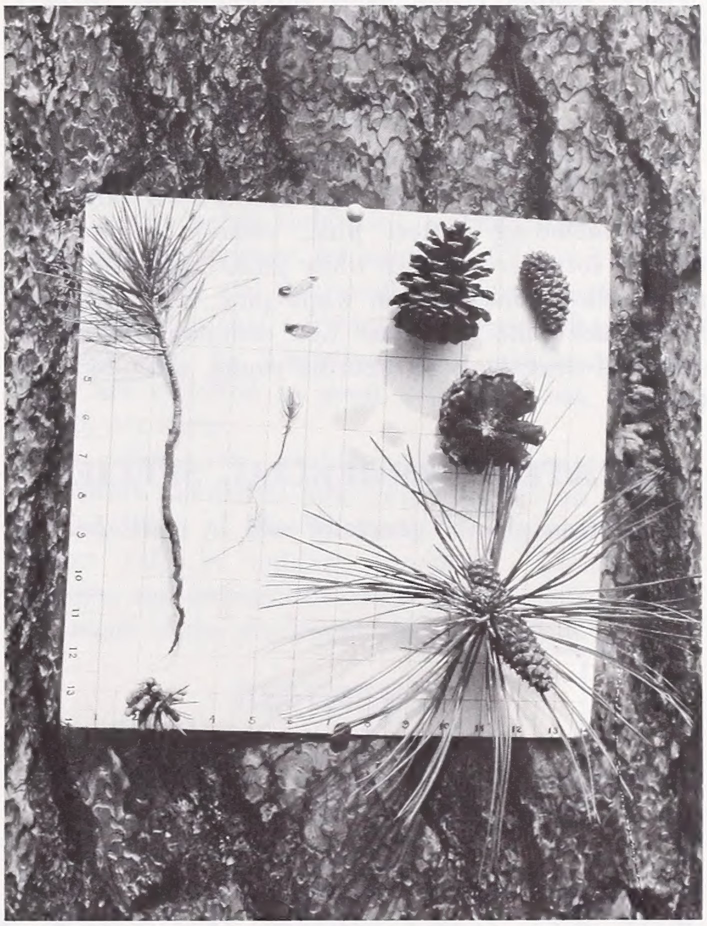
As its wide distribution suggests, ponderosa pine grows on a large variety of soils. It grows best on well-drained, deep-sandy gravel, and clay loams. It grows at elevations ranging from sea level to 9,000 feet, but is most commonly found at elevations between 4,000 and 8,000 feet. It grows generally on benches, plateaus, and west and south aspects.

DESCRIPTION AND GROWTH

Ponderosa pine is pyramidal when young, but the crown flattens at maturity. Mature trees may attain diameters in excess of 90 inches (measured at breast height) and total heights of more than 200 feet. It is generally long-lived, attaining ages well beyond 300 years. One tree in eastern Oregon was 726 years old.

The needles of the ponderosa pine are gray-green to dark yellow-green, about 7 inches long, and are almost always in clusters of three. The cones, which grow either singly or in clusters, are about 3½ inches long, and are ovoid to elliptical. The seeds are about ¼ inch long and have light tan wings (fig. 2).

Bark on the young trees is furrowed and black, but turns yellowish-brown to cinnamon color and becomes heavily plated in older trees. It is from the yellow bark that the tree derived its once-popular name, yellow pine (fig. 2).



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Ponderosa pine produces seed at irregular intervals that are influenced by area, age class, and tree size. Good seed crops can occur as infrequently as once in 23 years. Because of the irregularity of seed production, naturally regenerated stands are frequently either understocked or overstocked. Given proper stocking, ponderosa pine is capable of growing at exceptionally fast rates. In Idaho, for example, some stands have grown at the rate of 1,000 board feet per acre per year over a 17-year period.

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NOTE: This publication supersedes unnumbered publication *Ponderosa Pine,* issued 1953.

Ponderosa pine is more shade-tolerant than western larch, but less so than Douglas-fir, sugar pine, white fir, incense cedar, grand fir, or western white pine. The species responds vigorously when the competing vegetation is removed from around it.

Although fire is a considerable threat to dense stands of ponderosa pine saplings or small pole-sized timber, the mature trees are quite fire-resistant. At least 108 species of insects attack the species in its westernmost range, and 59 insect species attack in the Rocky Mountain area. Principal insect enemies include the bark beetles of the general *Dendroctonus* and *Ips*. Several root, stem, or leaf diseases are common in ponderosa pine, including brown root-and-butt rot *(Fomes annosus)*, red heart rot*(Polyporus anceps)*, and dwarfmistletoe *(Arceuthobium vaginatum)*.

COMMON NAMES

Ponderosa pine is the common name now generally used, but the species was once known by a variety of names including western pine, western yellow pine, western soft pine, western white pine, California white pine, yellow pine, Oregon white pine, bull pine, and black jack pine. The last two common names are still used extensively to describe young, second-growth timber.

RELATED COMMERCIAL SPECIES

Ponderosa pine is generally sold by itself because of its high marketability, although Jeffrey pine (*Pinus jeffreyi* Grev. and Balf.) is included without distinction. In some instances, the lower lumber grades of sugar pine (*Pinus lambertiana* Dougl.) and western white pine (*Pinus monticola* Dougl.) are marketed as ponderosa pine. Occasionally, small amounts of lodgepole pine (*Pinus contorta* Dougl.) are included with ponderosa pine lumber.

SUPPLY

The total stand of ponderosa pine sawtimber (combined with intermingled Jeffrey pine) in the United States in 1963 was estimated to be 242 billion board feet. The net volume of growing stock, which includes smaller trees, was estimated to be 45 billion cubic feet. These volumes grow chiefly on an estimated 36 million acres of commercial forest land classified as ponderosa pine type. Nearly half of the commercial acreage and nearly two thirds of the sawtimber volume occur in Washington, Oregon, and California. The remaining sawtimber occurs in Arizona, Idaho, New Mexico, Montana, Colorado, South Dakota, Wyoming, Utah, and Nevada in descending order.

PRODUCTION

The production of ponderosa pine lumber has exceeded 1 billion board feet annually since 1910. Production reached an all-time high in 1941 when an estimated 4.25 billion board feet was produced (fig. 3). Lumber production in 1963 was estimated at 3.6 billion board feet.

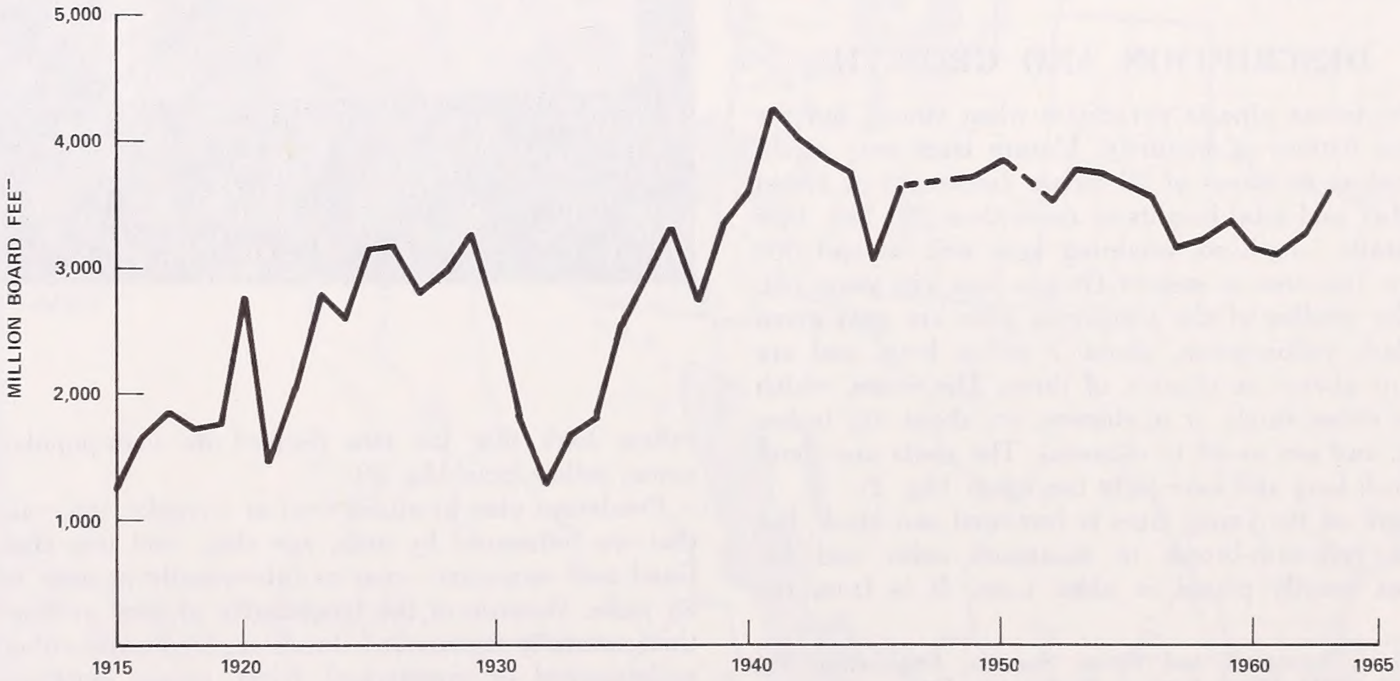

Figure 3.—Ponderosa pine lumber production, 1915-1963.

A relatively small amount of ponderosa pine plywood is manufactured in the form of knotty-pine plywood paneling. Many pine sawmills remanufacture cut stock for toy, furniture, and other specialty products. The cut stock is usually derived from in-plant salvage or is cut from low-grade lumber that has relatively poor marketing opportunities.

Ponderosa pine is presently being manufactured into treated poles in at least one mill in Arizona. In 1947, a total of 6,600 poles were produced in Montana, Idaho, and northwestern Washington combined.

Production figures are not available, but a substantial volume of ponderosa pine is harvested for fenceposts. Fenceposts are generally cut from overstocked second-growth stands in conjunction with silvicultural thinnings. Fencepost production is greatest in Arizona, New Mexico, and South Dakota, where abundant pure stands of ponderosa pine occur and where other species suitable for fenceposts are not plentiful.

CHARACTERISTICS AND PROPERTIES

The sapwood of ponderosa pine is nearly white to pale yellow and generally 2 inches, or more, in width. In young growth, sapwood may make up more than half the volume. The heartwood is yellowish to light reddish or orange brown and usually quite distinct from the sapwood. The wood has a distinct resinous odor, but no characteristic taste. The grain is generally straight and varies considerably in rings per inch. Although the wood is noted for its fine machining properties, it is considered medium coarse-textured. Frequently dimpled on the tangential surface, the wood is comparatively light in weight, soft, moderately weak in bending and endwise compression, and low in shock resistance. It is average in paint-holding ability, is easy to work, and glues especially well. It resists splitting when nailed, but is only average in nail-holding ability.

Ponderosa pine dries easily either in dry kilns or by air seasoning when proper methods are used and is moderately low in shrinkage. When properly manufactured and installed, ponderosa pine stays in place very well. Under conditions favorable to decay it is not durable unless properly treated with preservatives. Ponderosa pine is especially well suited for all kinds of millwork: window frames, doors, shelving, molding, and paneling. It is also well suited for furniture if hardness or high strength is not required. It is perfectly satisfactory for light framing members like studs and trusses in applications where loads are minimal.

PRINCIPAL USES

Ponderosa pine has been in relatively high demand since the West was settled. The Lewis and Clark Expedition of 1804-1806 made its dugout canoes of ponderosa pine logs for the trip down the Clearwater River. As early as 1915 more than 1.2 billion board feet of ponderosa pine lumber was manufactured, and by 1920 production was nearing 3 billion board feet. To the early western settler, ponderosa pine was plentiful, readily available, and easy to manufacture. Also, this pine was one of the first species demanded when western lumber entered the eastern market. Today, it is frequently the standard by which other soft-textured softwoods are compared. It remains in relatively high demand, which ensures relatively stable prices.

Principal uses now include paneling, molding, shelving, trim, sheathing, and low-load framing. Ponderosa is the major species selected for construction of windows and panel doors. Significant volumes are still used for wooden boxes and wooden furniture, especially that which is nonupholstered. Some small additional amounts are used in conjunction with metal furniture, mattresses, and bedsprings. Other manufactured applications of this wood include pattern stock in the metals industries, wooden toys, caskets, footwear, and luggage. In roundwood form it is used for posts, poles and pulpwood. Ponderosa pine serves esthetic uses in that substantial numbers of trees are cut each year for Christmas trees and boughs and cones are collected in great quantities and used as novelty art items.

The open-grown, parklike stands of mature and overmature ponderosa pine have always been esthetically important to the West and have played an important role in outdoor recreation. Considerable big-game and domestic-livestock range is intermingled with much of the ponderosa pine forest type.

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